REMARKS

The Office Action dated June 25, 2009 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1-4, 11, 13-15, 18-22, and 35-41 have been amended to more particularly point out and distinctly claim the subject matter of the invention. No new matter has been added. Therefore, claims 1-41 are currently pending in the application and are respectfully submitted for consideration.

Allowable Subject Matter

The Office Action indicated that claims 19-21 and 29-38 are allowed. In a telephone conversation on September 15, 2009, the Examiner clarified that only claims 19-21, 29-34, and 36-38 are allowed, and that claim 35 is still subject to at least one rejection. Applicants thank the Examiner for the allowance of claims 19-21, 29-34, and 36-38. Claims 19-21, 29-34, and 36-38 have been amended in light of the various objections/rejections of the Office Action, as discussed below. Applicants respectfully submit that none of the amendments affect the allowability of claims 19-21, 29-34, and 36-38. Accordingly, Applicants respectfully request that claims 19-21, 29-34, and 36-38 be allowed.

Claim Objections

The Office Action objected to claims 1-3, 11, 13-14, 18-21, and 35-41 because of informalities. Specifically, the Office Action alleged that, "transmissible," in independent claims 1-3, 18-21, and 35-41, is not a positive limitation, and does not clearly define if the signal is to be transferred or not. Additionally, the Office Action alleged that "the filter matched to a chip pulse waveform from the transmissible signal," as recited in independent claims 1-3, 18-21, and 35-41 lacks proper antecedent basis.

With respect to "transmissible," Applicants respectfully disagree with the Office Action's assertion that "transmissible" is not a positive limitation." Nevertheless, Applicants have amended claims 1-3, 11, 13-14, 18-21, and 35-41 to remove all instances of "transmissible." With respect to "the filter matched to a chip pulse waveform from the transmissible signal," Applicants have amended claims 1-3, 11, 13-14, 18-21, and 35-41 to replace "the filter," with "a filter." The amendments to the claims effectively moot the objection. Accordingly, Applicants respectfully request that the objection be withdrawn.

Furthermore, the Office Action alleged that claim 11 recites "a second clipping stage," yet there is no first clipping stage. Applicants have amended claim 11 to recite "a clipping stage," rather than "a second clipping stage." The amendment to the claim effectively moots the objection. Accordingly, Applicants respectfully request that the objection be withdrawn.

Finally, the Office Action alleged that claims 13 and 14 each recite codes and unused codes, yet it is unclear what the codes refer to because there is no recitation of codes in independent claim 2. Applicants respectfully submit that claims 13 and 14 have been amended to recite "wherein the orthogonalizing the error signal utilizes unused codes," and "the orthogonalizing the error signal utilizes codes used at a lower modulation level," respectively. Applicants further submit that the amendments to the claims effectively moot the rejection because the claims make clear that the codes are used in the orthogonalizing the error signal (as recited in claim 2). Furthermore, one of ordinary skill in the art would readily understand that orthogonalization utilizes a matrix which includes rows or columns of codes used to generate orthogonal unit vectors. (See e.g. Specification at paragraphs 0038-0040). Accordingly, Applicants respectfully request that the objection be withdrawn.

Claim Rejections Under 35 U.S.C. § 101

The Office Action rejected claims 39-41 under 35 U.S.C. § 101 because the claims are allegedly directed to non-statutory subject matter. Specifically, the Office Action indicated that claims 39-41 are interpreted to be computer programs representing computer listing per se because paragraph 0092 of the specification allegedly states that the invention is implemented in software. This rejection is respectfully traversed.

Claim language is to be given its plain and ordinary meaning as understood by one of ordinary skill in the relevant art at the time of the invention. *Phillips v. AWH Corp.*, 75 USPQ2d 1321, 1326 (Fed. Cir. 2005). While claims are interpreted in light of the specification, it is improper to import unnecessary limitations from the specification into the claims. *Altiris Inc. v. Symantec Corp.*, 65 USPQ2d 1865, 1869-70 (Fed. Cir. 2003). The Office Action's interpretation of claims 39-41 as computer programs per se violate both of these fundamental principles of claim interpretation. Claims 39-41 each recite "a computer-readable medium encoded with a computer program." Thus, the plain and ordinary meaning of the claim language makes clear that the claims are not directed to computer programs per se, but instead are directed to functional descriptive material embodied on a computer-readable medium, which is statutory subject matter. (See MPEP § 2106.01 – Computer-Related Non-Statutory Subject Matter). Furthermore, the Office Action's reliance upon a paragraph in the specification to support its erroneous claim interpretation improperly imports limitations from the specification in the claims.

Accordingly, the rejection is unfounded, as claims 39-41 recite statutory subject matter under 35 U.S.C. § 101. Applicants respectfully request that this rejection be withdrawn.

Claim Rejections Under 35 U.S.C. § 112

The Office Action rejected claims 39-41 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement (i.e. allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention). Specifically, the Office Action alleged that a computer program product embodied on a computer-readable medium was not disclosed in the specification. This rejection is respectfully traversed for at least the following reasons.

Adequate written description under 35 U.S.C. § 112, first paragraph, does not require literal support for the claimed invention. Rather, it is sufficient if the originally-filed disclosure would have conveyed to one having ordinary skill in the art that an applicant had possession of the concept of what is claimed. *See Ex parte Parks*, 30 USPQ2d 1234 (B.P.A.I. 1994); *see also Ralston Purina Co. v. Far-Mar-Co, Inc.*, 772 F.2d 1570, 227 USPQ 117 (Fed. Cir. 1985 ("the test for sufficiency of support in an [application] is whether the disclosure of the application relied upon reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter").

Paragraph 0073 of the originally filed specification states that the invention is preferably implemented by software, whereby the base station 204 typically comprises a

microprocessor, in which the functions according to the method described are implemented as functional software. One of ordinary skill in the art of telecommunications would readily understand that software may take the form of a computer program, and that a microprocessor is a type of computer-readable medium. Thus, one of ordinary skill in the art would also understand that the inventor had possession of the claimed invention at the time the application was filed. Accordingly, claims 39-41 comply with the written description requirement of 35 U.S.C. § 112, and Applicants respectfully request that this rejection be withdrawn.

The Office Action rejected claim 15 under 35 U.S.C. § 112, second paragraph for allegedly be indefinite. Specifically, the Office Action alleged that there is insufficient basis for "the orthogonalization of the error signal." Applicants respectfully submit that claim 15 has been amended to recite "the dividing the error signal," and thus, the amendment to the claim effectively moots the rejection. Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claim Rejections Under 35 U.S.C. § 103

The Office Action rejected claims 1, 4-6, and 39 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hiramatsu (U.S. Patent No. 6,701,163), in view of Hunton (U.S. Publication No. 2003/0026351). The Office Action took the position that Hiramatsu discloses all the elements of the claims with the exception of generating a

limited transmissible signal by reducing an error signal filtered using the filter matched to a chip pulse waveform from the transmissible signal. The Office Action then cited Hunton as allegedly curing the deficiencies of Hiramatsu. Applicants respectfully submit that said claims recite subject matter neither disclosed nor suggested in Hiramatsu and Hunton.

Claim 1, upon which claims 4-10 are dependent, recites a method, which includes determining, at a processor, a limiting signal from a signal filtered using a pulse shaping filter, and determining an error signal using the signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal. The method further includes generating a limited signal by reducing an error signal filtered using a filter matched to a chip pulse waveform from the signal.

Claim 39 recites a computer-readable medium encoded with a computer program, for controlling a processor to implement a method. The method includes determining a limiting signal from a signal filtered using a pulse shaping filter, and determining an error signal using the signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal. The method further includes generating a limited signal by reducing an error signal filtered using a filter matched to a chip pulse waveform from the signal.

As will be discussed below, the combination of Hiramatsu and Hunton fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the features discussed above.

Hiramatsu describes a base station apparatus which is capable of suppressing a transmission amplitude at the time of a peak without increasing the number of its filter operation circuits and a method for suppressing the base station apparatus' peak power. Specifically, Hiramatsu describes a block diagram showing a base station which includes modulation sections 101, 102, and 103, which respectively modulates transmission signals A, B, and C. The block diagram also includes filters 110 and 111, which respectively take a transmission signal as an input signal and perform a band restriction of the signal. The block diagram further includes an envelope calculation section 113, a correction coefficient calculation section 114, and multiplication sections 115 and 116. The envelope calculation section 113 calculates an amplification of the input transmission signal. The correction coefficient calculation section 114 performs a comparison of largeness between the amplitude of the transmission signal calculated by the envelope calculation section 113 and a permissible amplitude value set. Multiplication sections 115 and 116 respectively multiply a correction coefficient outputted from the correction coefficient calculation section 114 by a filter coefficient set in filter coefficient memory 112. Finally, the block diagram includes subtraction sections 119 and 120 which respectively decrease the amplitude of an input transmission signal by

subtracting a correction value calculated by the respective multiplication sections 115 and 116, and delay sections 116 and 118, which respectively delay the filter signal outputted from filters 110 and 111. (See Hiramatsu at col. 4, line 15 – col. 5, line 65).

Hunton describes a system and method for post-filtering signal peak reduction adapted for use in a multi-carrier communication system incorporating a source of multi-carrier communication signal band limited in plural bands corresponding to the plural carriers. In the system of Hunton, two signal streams are input to a signal-peak suppression unit 110. The suppression unit 110 processes the two streams as a signal complex stream S. The signal-peak suppression unit 110 includes two parallel signal paths, a path with a delay 120, and a parallel correction signal path. The parallel correction signal path includes an algorithm processor 140 which calculates a correction vector C, and a switch 150. Switch 150 either selects the correction vector C or a value zero and outputs the selected value to several parallel time delay matched correction filter paths. Each correction filter path includes a gain circuit, and a correction filter 170. The outputs of the correction filter paths are combined at combine 130 with a time-delayed version of the signal stream S. (See Hunton at paragraphs 0022-0024).

Applicants respectfully submit that Hiramatsu and Hunton, whether considered individually or in combination, fail to disclose, teach, or suggest, all of the elements of the present claims. For example, the combination of Hiramatsu and Hunton fails to disclose, teach, or suggest, at least, "determining an error signal using the signal and the

limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal," as recited in independent claim 1, and similarly recited in independent claim 39.

Hiramatsu described generating a correction value via a correction coefficient calculation section 114 and a multiplication section 115. Specifically, the correction coefficient calculation section 114 calculates a correction coefficient based on the largeness of the amplitude of the transmission signal output from filter 110 and the permissible amplitude value, and the multiplication section 115 multiplies the correction coefficient by a filter coefficient set. (See Hiramatsu at col. 5, lines 9-36). Hiramatsu fails to disclose or suggest taking the opposite sign of the difference between the amplitude of the transmission signal and the permissible amplitude value in order to reduce the transmission signal. Instead, a correction value outputted from multiplication section 115 is subtracted from a signal output from delay filter 117. (See Hiramatsu at col. 8, lines 15-24).

Furthermore, Hunton does not cure the deficiencies of Hiramatsu. Hunton describes that a peak reduction calculation circuit calculates a correction value based on an input signal S and a constant L. A switch then selects either the calculated correction value or zero depending on whether the magnitude of input signal S exceeds constant L. The correction signal (which includes either the calculated correction value or zero) is then combined with a time-delayed version of signal S. Hunton fails to disclose or

suggest taking the opposite sign of the difference of the signal S and a constant L and using it to reduce signal S. Instead, Hunton merely discloses combining signal S with a calculated correction signal.

Therefore, the combination of Hiramatsu and Hunton fails to disclose, teach, or suggest, all of the elements of independent claims 1 and 39. Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claims 4-6 depend upon independent claim 1. Thus, Applicants respectfully submit that claims 4-6 should be allowed for at least their dependence upon independent claim 1, and for the specific elements recited therein.

The Office Action rejected claims 2, 12-14, 18, 22-24, 35, and 40 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Hiramatsu in view of Chang (U.S. Patent No. 6,628,605). The Office Action took the position that Hiramatsu discloses all the elements of the claims with the exception of orthogonalizing the error signal. The Office Action then cited Chang as allegedly curing the deficiencies of Hiramatsu. Applicants respectfully submit that said claims recite subject matter neither disclosed nor suggested in Hiramatsu and Chang.

Claim 2, upon which claims 11-14 are dependent, recites a method, which includes determining, at a processor, a limiting signal from a signal filtered using a pulse shaping filter, and determining an error signal using the signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal.

The method further includes orthogonalizing the error signal filtered using a filter matched to a chip pulse waveform, and generating a limited signal by reducing the orthogonalized error signal from the signal.

Claim 18 recites an apparatus, which includes means for determining a limiting signal from a signal filtered using a pulse shaping filter, and means for determining an error signal using the signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal. The apparatus further includes means for generating a limited signal by reducing the error signal filtered using a filter matched to a chip pulse waveform from the signal, and means for filtering the limited signal using the pulse shaping filter.

Claim 35, upon which claims 22-28 are dependent, recites an apparatus, which includes a limiting determiner configured to determine a limiting signal from a signal filtered using a pulse shaping filter, and an error determiner configured to determine an error signal using the signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal. The apparatus further includes a generator configured to generate a limited signal by reducing the error signal filtered using a filter matched to a chip pulse waveform from the signal, and a filter configured to filter the limited signal using the pulse shaping filter.

Claim 40 recites a computer-readable medium encoded with a computer program, for controlling a processor to implement a method. The method includes determining a

limiting signal from a signal filtered using a pulse shaping filter, and determining an error signal using the signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal. The method further includes orthogonalizing the error signal filtered using a filter matched to a chip pulse waveform, and generating a limited signal by reducing the orthogonalized error signal from the signal.

As will be discussed below, the combination of Hiramatsu and Chang fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the features discussed above.

Hiramatsu is described above. Chang describes a method and apparatus for efficiently transmitting multiple data signals. A switch determines the timing signals associated with each data input and then re-times the data based upon timing signals at the switch output. Timing signals are routed through a multiplexer that preferably determines the difference between the timing signal and a reference signal, combines the difference signal with other difference signals calculated for other data inputs, and transmits the multiplexed difference signals to a demultiplexer. (See Chang at Abstract). Applicants respectfully submit that Hiramatsu and Chang, whether considered individually or in combination, fail to disclose, teach, or suggest, all of the elements of the present claims. For example, the combination of Hiramatsu and Chang fails to disclose, teach, or suggest, at least, "determining an error signal using the signal and the

limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal," as recited in independent claim 2, and similarly recited in independent claims 18, 35, and 40.

While each of the claims have their own scope, Applicants respectfully submit that Hiramatsu fails to disclose the aforementioned limitation for similar reasoning as to why Hiramatsu fails to disclose "determining an error signal using the signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal," as recited in independent claim 1.

Furthermore, Chang does not cure the deficiencies of Hiramatsu. Rather, Chang merely describes difference signals 420 and 422 is encoded by CDMA encoder 412 and 414 with an orthogonal code, and frequency modulated as a carrier frequency. (See Chang at col. 9, lines 1-11).

Therefore, the combination of Hiramatsu and Chang fails to disclose, teach, or suggest, all of the elements of independent claims 2, 18, 35, and 40. Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claims 12-14 depend upon independent claim 2. Claims 22-24 depend upon independent claim 35. Thus, Applicants respectfully submit that claims 12-14 and 22-24 should be allowed for at least their dependence upon independent claims 2 and 35, and for the specific elements recited therein.

The Office Action rejected claims 3, 15-17, and 41 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Hiramatsu, in view of Ozluturk (U.S. Publication No. 2005/0213691). The Office Action took the position that Hiramatsu discloses all the elements of the claims with the exception of dividing an error signal onto different carriers in a predetermined manner. The Office Action then cited Ozluturk as allegedly curing the deficiencies of Hiramatsu. Applicants respectfully submit that said claims recite subject matter neither disclosed nor suggested in Hiramatsu and Ozluturk.

Claim 3, upon which claims 15-17 are dependent, recites a method, which includes combining, at a processor, at least two signals modulated on different carriers to a combination signal, and determining a limiting signal from the combination signal filtered using a pulse shaping filter. The method further includes determining an error signal using the combination signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal, and dividing the error signal onto different carriers in a predetermined manner. The method further includes generating limited signals by reducing each error signal part filtered using a filter matched to a chip pulse waveform from a corresponding signal.

Claim 41 recites a computer-readable medium encoded with a computer program, for controlling a processor to implement a method. The method further includes combining at least two signals modulated on different carriers to a combination signal, and determining a limiting signal from the combination signal filtered using a pulse

shaping filter. The method further includes determining an error signal using the combination signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal, and dividing the error signal onto different carriers in a predetermined manner. The method further includes generating limited signals by reducing each error signal part filtered using a filter matched to a chip pulse waveform from a corresponding signal.

As will be discussed below, the combination of Hiramatsu and Ozluturk fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the features discussed above.

Hiramatsu is described above. Ozluturk describes a system for balancing a signal having I and Q components. The system includes means for cross-correlating the I and Q components to produce a cross-correlation product. The system also includes means for adjusting the gain of each I and Q signal component in accordance with the cross-correlation product. The system also includes means for adding one component with the adjustable gain of the other component to produce a phase-balanced signal. (See Ozluturk at Abstract).

Applicants respectfully submit that Hiramatsu and Ozluturk, whether considered individually or in combination, fail to disclose, teach, or suggest, all of the elements of the present claims. For example, the combination of Hiramatsu and Ozluturk fails to disclose, teach, or suggest, at least, "determining an error signal using the combination

signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal," as recited in independent claim 3, and similarly recited in independent claim 41.

While each of the claims have their own scope, Applicants respectfully submit that Hiramatsu fails to disclose the aforementioned limitation for similar reasoning as to why Hiramatsu fails to disclose "determining an error signal using the signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal," as recited in independent claim 1.

Furthermore, Ozluturk does not cure the deficiencies of Hiramatsu. Ozluturk merely describes an amplitude balancing system 17 where two bi-phase modulated signals 19 are input 21I, and 21Q, where I is the real component of the signal and Q is the imaginary component of the signal. (See Ozluturk at paragraphs 0008 and 0025).

Therefore, the combination of Hiramatsu and Ozluturk fails to disclose, teach, or suggest, all of the elements of independent claims 3 and 41. Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claims 15-17 depend upon independent claim 3. Thus, Applicants respectfully submit that claims 15-17 should be allowed for at least their dependence upon independent claim 3, and for the specific elements recited therein.

The Office Action rejected claims 7-10 and 25-28 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Hiramatsu and Hunton, in view of McGowan (U.S.

Publication No. 2002/0012403). The Office Action took the position that the combination of Hiramatsu and Hunton discloses all the elements of the claims with the exception of "wherein the limiting signal is determined by means of a threshold value set for the power or amplitude values." The Office Action then cited McGowan as allegedly curing the deficiencies of Hiramatsu and Hunton. Applicants respectfully submit that said claims recite subject matter neither disclosed nor suggested in Hiramatsu, Hunton, and McGowan.

Hiramatsu and Hunton are discussed above. McGowan describes a peak power regulator that functions within a Code Division Multiple Access transmitter to reduce peak power spikes within baseband signals while maintaining the average output power consistent with the average input power, controlling the out-of-band emissions, and maintaining the in-band signal quality within an acceptable degregation. (See McGowan at Abstract).

Claims 7-10 and 25-28 depend upon independent claims 1 and 35, respectively. As discussed above, the combination of Hiramatsu and Hunton does not disclose, teach, or suggest all of the elements of independent claims 1 and 35. Furthermore, McGowan does not cure the deficiencies in Hiramatsu and Hunton, as McGowan also does not disclose, teach, or suggest, at least, "determining an error signal using the signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal," as recited in independent claim 1, and similarly recited in

independent claim 35. Thus, the combination of Hiramatsu, Hunton, and McGowan does not disclose, teach, or suggest all of the elements of claims 7-10 and 25-28. Additionally, claims 7-10 and 25-28 should be allowed for at least their dependence upon independent claims 1 and 35, respectively, and for the specific elements recited therein.

The Office Action rejected claim 11 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hiramatsu and Chang, in view of Dartois (U.S. Publication No. 2002/0042253). The Office Action took the position that the combination of Hiramatsu and Chang discloses all the elements of the claims with the exception of "wherein a second clipping stage is added." The Office Action then cited Dartois as allegedly curing the deficiencies of Hiramatsu and Chang. Applicants respectfully submit that said claims recite subject matter neither disclosed nor suggested in Hiramatsu, Chang, and Dartois.

Hiramatsu and Change are described above. Dartois describes a method for clipping a wideband signal in order to eliminate signal overshots having an amplitude above a predefined threshold before submitting the wideband signal to a power amplifier. (See Dartois at Abstract).

Claim 11 depends upon independent claim 2. As discussed above, the combination of Hiramatsu and Chang does not disclose, teach, or suggest all of the elements of independent claim 2. Furthermore, Dartois does not cure the deficiencies in Hiramatsu and Chang, as Dartois also does not disclose, teach, or suggest, at least, "determining an error signal using the signal and the limiting signal by changing the

limiting signal so as to be of an opposite sign and reducing from the signal," as recited in independent claim 2. Thus, the combination of Hiramatsu, Chang, and Dartois does not disclose, teach, or suggest all of the elements of claim 11. Additionally, claim 11 should be allowed for at least their dependence upon independent claim 2, and for the specific elements recited therein.

Based on the above discussion, Applicants respectfully submit that the cited prior art references fail to disclose or suggest all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1-41 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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